Journal Homepage: -www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/22398
DOI URL: http://dx.doi.org/10.21474/IJAR01/22398

RESEARCH ARTICLE

EFFECTIVENESS OF AUDIO-VISUAL MULTIMEDIA INTERVENTION IN ENHANCING ARABIC VOCABULARY ACQUISITION AMONG PRIMARY SCHOOL PUPILS

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Manuscript Info

Manuscript History
Received: 8 October 2025
Final Accepted: 10 November 2025
Published: December 2025

Key words:-
Arabic Vocabulary Acquisition, Audio-Visual Multimedia, Primary School Education, Technology-Assisted Language Learning

Abstract

The difficulty of learning Arabic vocabulary among primary school student s is often the focus of adult language researchers today. Various methods and interventions have been introduced to address this problem, including the use of audio-visual multimedia technology, which can more effectively enrich students' vocabulary learning experiences. Therefore, this study aims to identify issues in learning Arabic vocabulary and analyze and evaluate the effects of using audio-visual multimedia technology among students of Telok Panglima Garang Religious Primary School. This researc h employs a quantitative approach, collecting data through pre- and post-tests and questionnaires administered to 25 second year students. Descripti ve and inferential analyses are used to characterize the respondent profile and evaluate the intervention's impact on academic achievement and student acceptance. The results show a significant difference between the pre-test and post-test. There is an increase in educational attainment, with a mean value of -1.34 (t (24) = -6.664, p <.001), whereas student acceptance shows a significant difference, with a mean value of -1.388 (t (24) = -6.907, p <.001). However, there was no significant difference in the analysis of gender factors when academic achievement was included (p = 0.947), whereas student acceptance was substantial (p = 0.203). This indicates that the audio-visual multimedia technology intervention had a positive overall impact, regardless of gender. This study provides theoretic al and even practical contributions to improving academic achievement and student acceptance of Arabic vocabulary learning using audio-visual multimedia technology, thereby supporting its use in second language education.

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Introduction:-

Vocabulary mastery constitutes a fundamental component of Arabic language learning, particularly at the primary school level, as it plays a critical role in shaping pupils' communicative, reading, writing, and comprehension skills. Pupils with a strong vocabulary base are better able to understand texts, construct accurate sentences, and interact effectively in Arabic. Nevertheless, a considerable number of pupils face difficulties in acquiring vocabulary. Differences in linguistic structure, together with traditional teaching and learning approaches, have been identified as key factors contributing to these challenges. Pupils also struggle to retain the meanings of newly introduced words.Such conditions lead to less engaging learning experiences, negatively affecting pupils' motivation and hindering long-term mastery. With advancements in educational technology, the use of multimedia, particularly audio-visual materials, offers a more engaging and interactive alternative. Beyond stimulating multiple senses, the integration of audio and visual elements within multimedia technology supports accurate pronunciation and reinforces learning. Furthermore, it enhances learners' attention and facilitates vocabulary comprehension and retention (Hanifah &Makruf, 2023). Accordingly, this study was conducted to assess the effectiveness of audio-visual multimedia technology in improving Arabic vocabulary acquisition among primary school pupils and to propose more effective instructional approaches for Arabic language education.

Vocabulary mastery is essential in Arabic language learning at the primary level, as it underpins pupils' abilities in reading, writing, comprehension, and speaking. However, preliminary findings at Sekolah Rendah Agama Telok Panglima Garang reveal that vocabulary proficiency among pupils remains low and concerning. Many pupils face difficulties understanding word meanings, pronouncing them correctly, and applying them in sentences. These issues stem partly from traditional teaching methods that rely heavily on rote memorization and direct translation, with minimal incorporation of interactive strategies. Such approaches render pupils passive recipients of information, with limited opportunities for critical or creative engagement, ultimately diminishing interest and motivation (Shah & Basnyat, 2024).Insufficient exposure to vocabulary use across diverse and meaningful contexts further exacerbates the problem. Broad and contextualised vocabulary usage strengthens pupils' more profound understanding and supports more flexible language use. Both the variety and quality of exposure, as well as the quantity, are essential elements in vocabulary development (Persici et al., 2022). Hence, there is an urgent need to explore more engaging and effective instructional methods, such as audio-visual multimedia that integrates visual and auditory stimuli to enhance interest and comprehension. This study, therefore, aims to evaluate the effectiveness of the audio-visual multimedia approach in enhancing pupils' mastery of Arabic vocabulary as an alternative to conventional teaching methods.

Research Objectives:-

This study aims to:

- Identify pupils' level of acceptance towards the use of audio-visual multimedia technology in vocabulary learning.
- Assess the effects of audio-visual multimedia technology on pupils' academic achievement in Arabic vocabulary mastery.
- Determine whether there are differences in the effects of audio-visual multimedia technology on vocabulary mastery based on gender.

Research Questions:-

This study addresses the following research questions:

- What is the level of pupils' acceptance towards the use of audio-visual multimedia technology in learning Arabic vocabulary?
- What are the effects of using audio-visual multimedia technology on pupils' academic achievement in Arabic vocabulary mastery?
- Are there significant gender differences in pupils' academic achievement and level of acceptance towards the use of audio-visual multimedia technology?

Research Hypotheses:-

- H_{01}: There is no significant difference in pupils' academic achievement before and after the use of audio-visual multimedia technology.

- H_{02}: There is no significant difference in pupils' level of acceptance towards Arabic vocabulary learning before and after the use of audio-visual multimedia technology.
- H_{03}: There is no significant gender difference in pupils' academic achievement and level of acceptance regarding the use of audio-visual multimedia technology.

Significance of the Study:-

This study's findings will contribute to the theoretical understanding of multimedia's role in Arabic vocabulary acquisition and inform practical strategies for language teaching at the primary level.Practically, the study offers valuable insights for Arabic language teachers and curriculum developers by providing more creative, interactive, and learner-centred instructional strategies grounded in multimedia-based materials. The study also provides empirical evidence to support the development of teaching modules and learning aids aligned with 21st-century learning requirements.Modules inspired by this study typically prioritise critical thinking skills, project-based learning, and the integration of multimedia technology. Such modules reflect an inquiry-based approach that aligns with the demands of 21st-century education (Islamiati et al., 2024). Additionally, the final research report can offer constructive recommendations to the Ministry of Education Malaysia, supporting policy plans that promote the integration of multimedia technology in teaching and learning. This aligns with the aspirations of the Malaysian Education Blueprint to enhance the use of multimedia technology within the national curriculum.

Literature Review:-

Challenges in Mastering Arabic Vocabulary:-

Vocabulary mastery is a fundamental component of language learning, and within the context of Arabic as a foreign language in Malaysia, primary school pupils encounter numerous challenges that hinder effective vocabulary acquisition. One of the significant challenges is the differences in linguistic structure, particularly the complex morphological system of Arabic, such as root patterns (juzur), morphological derivations (tasrif), and gender distinctions (masculine and feminine), which often confuse learners unfamiliar with these concepts in Malay. In addition, the limited exposure to Arabic in daily life restricts pupils to using vocabulary only within classroom settings, with little opportunity for real-world application. Research indicates that limited exposure to Arabic outside the classroom can result in pupils acquiring only basic oral proficiency, while remaining weak in literacy skills (reading and writing) and pragmatic language use (Aldawood et al., 2023). A passive and unengaging learning experience, driven by traditional memorisation and translation-based methods, further contributes to low comprehension and weak retention of new vocabulary.

Learner attitudes and motivation also play a significant role. Arabic is often perceived as difficult and unenjoyable, especially when the teaching approach lacks interactivity or modern technological support. This problem is exacerbated by non-conducive learning environments, such as insufficient visual aids, limited parental support, and time constraints within the curriculum that compel teachers to rush through the syllabus without systematic vocabulary reinforcement. Early childhood studies show that meaningful interaction and the use of visual aids enhance vocabulary development when children are immersed in rich and responsive language environments. In contrast, poor learning environments lead to weaker outcomes (Hansen & Broekhuizen, 2020). Therefore, to improve vocabulary mastery in primary-level Arabic education, these challenges necessitate adopting creative, learner-centred teaching and learning approaches.

Importance of Vocabulary Mastery at the Primary Level:-

Strong vocabulary mastery at an early stage of education is crucial because it forms the foundation for all other language skills; reading, writing, listening, and speaking. Vocabulary functions as the key building block of language comprehension; without sufficient lexical knowledge, pupils will struggle to understand instructions, questions, and learning content, which directly affects their academic performance in Arabic. A strong vocabulary base also facilitates the development of reading and writing skills, enabling pupils to express themselves more accurately, clearly, and fluently in both oral and written tasks. Studies show a strong positive correlation between vocabulary mastery and performance in reading and writing, indicating that higher proficiency in these skills reflects strong lexical competence (Sulistyaningrum & Siswantoro, 2019).

Moreover, robust vocabulary knowledge enhances pupils' motivation and confidence to participate in learning activities, making Arabic more meaningful and engaging in their daily lives (Lekawael & Ferdinandus, 2021). Long-term language learning builds upon early vocabulary mastery, as it helps learners link new information with existing knowledge and supports long-term memory retention (Rahman et al., 2019; Asyiah, 2017). From a cognitive

perspective, vocabulary acquisition stimulates mental functions such as memory, meaning association, and inferential reasoning, fostering more analytical and critical thinking. Pupils can better understand concepts contextually rather than relying solely on rote memorisation. Thus, vocabulary mastery not only strengthens language skills but also contributes significantly to cognitive development and learner confidence in mastering Arabic.

Multimedia Technology in Language Learning:-

The integration of multimedia technology into language education has transformed teaching and learning approaches, particularly in foreign language instruction such as Arabic. Multimedia, which integrates text, images, animations, videos, and audio, provides a more engaging, dynamic, and practical learning experience compared to traditional methods. In the context of Arabic vocabulary teaching, audio-visual materials such as animated videos, recorded native pronunciation, and interactive applications help learners understand word meanings in more concrete and contextual ways by stimulating multiple senses, especially sight and hearing. This enhances attention, comprehension, and long-term retention. By allowing pupils to learn at their own pace, multimedia supports learner-centred instruction and encourages active participation.

According to Mayer (2001), learners remember vocabulary more effectively when information is presented visually, auditorily, and in meaningful contexts; a principle particularly relevant for young learners who possess diverse learning styles and are accustomed to technology. This approach aligns with Mayer's (2021) Cognitive Theory of Multimedia Learning, which emphasises two main processing channels (visual and auditory) and three key principles: Dual Channel, Limited Capacity, and Active Processing. Additional principles such as Multimedia, Modality, Segmenting, Redundancy, and Personalisation further demonstrate how multimedia-based instructional design can be optimised for language learning. In this study, the use of audio-visual multimedia for teaching Arabic vocabulary fully aligns with these principles, offering strong support for contextual understanding, sustained attention, and improved long-term memory retention.

Gender Differences in Language Learning:-

Gender differences are a significant factor frequently discussed in language education research, including in the context of Arabic vocabulary mastery. From a sociocultural perspective, girls, particularly within Malaysian cultural norms, are often socialised to be more diligent, meticulous, and academically responsible. In contrast, boys are typically associated with higher physical activity, making them less focused on structured tasks such as memorisation and vocabulary learning.

Biologically and psychologically, girls tend to reach linguistic maturity earlier and have stronger verbal memory, enabling them to learn new vocabulary more effectively. Learning styles also influence these differences: girls generally prefer verbal and reflective learning, while boys tend to favour kinesthetic and visual approaches. Therefore, multimedia-based teaching must account for these differences by incorporating balanced visual, interactive, and auditory elements to maximise learning effectiveness for both genders.

Implications for the Present Study:-

This study examines the effects of audio-visual multimedia technology on Arabic vocabulary mastery among primary school pupils, and it is important to consider gender as a potential moderating factor. Multimedia may benefit girls more, given their linguistic strengths and sustained focus, whereas boys may respond more positively to stimulating features such as animations, gamification, and rhythmic audio. Understanding these differences is crucial to ensuring that multimedia interventions are designed equitably. Should the study find gender-based differences, the results can guide teachers and multimedia instructional designers in customising content, presentation styles, and strategies to meet the diverse needs of male and female learners.

Research Methodology:-

This study employed a one-group quasi-experimental design with pre- and post-tests to evaluate the intervention's effects on Arabic vocabulary mastery. This approach enabled the researcher to measure changes within the same group before and after the intervention. The methodology is divided into the following phases:

Phase 1: Pre-Study Procedures:-

At this stage, ethical approval was obtained from the school administration, and written consent was secured from parents or guardians. The sample consisted of 25 Year Two pupils from Sekolah Rendah Agama Telok Panglima

Garang, selected through purposive sampling based on teacher and school readiness, as well as the availability of technological resources to support multimedia implementation.
However, the small and localised sample limits the generalisability of the findings. Thus, the study is exploratory and aims to identify the initial potential of audio-visual multimedia in real classroom settings, with recommendations for future large-scale implementation.Two research instruments were developed and validated:

- Vocabulary mastery test: content validated by three Arabic language experts, reliability $\alpha = 0.84$.
- Pupil acceptance questionnaire: validated by two educational psychology experts, reliability $\alpha = 0.86$.

Phase 2: Initial Study Procedures:-
A pre-test was administered to measure baseline vocabulary mastery. Pupils were also briefed regarding the new multimedia-based instructional approach to prepare them for the intervention.

Phase 3: Data Collection:-
The intervention was conducted over three weeks across six learning sessions (two per week). Multimedia materials included:

- Animated Arabic vocabulary videos (everyday situational themes)
- Native-speaker audio recordings
- Interactive digital games (word matching, spelling games)

Each session lasted 30 minutes and was implemented based on a collaboratively designed Lesson Plan.

Phase 4: Data Analysis:-
Post-test and questionnaire data were collected after the intervention. SPSS Version 25.0 was used for analysis. A paired-sample t-test evaluated differences between pre- and post-test scores, while an independent-samples t-test assessed gender-based differences. A significance level of $p < .05$ was applied, and Cohen's d was calculated to determine effect sizes.

Phase 5: Reporting Findings:-
The results were analysed and discussed in relation to the effectiveness of the multimedia approach, pupil acceptance, and gender differences. Implications for teaching practice and curriculum development were highlighted, followed by recommendations for improvement and future research.

Findings and Discussion:-

Effectiveness of the Intervention on Academic Achievement:-

Table 1. Paired-Sample t-Test for Academic Achievement Scores

	Paired Differences							Significance	
				95% Confidence Interval of the Difference					
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	One-Sided p	Two-Sided p
Pair 1Pre vs Post	-1.34000	1.00540	.20108	-1.75501	-.92499	-6.664	24	<.001	<.001

A paired-sample t-test was conducted to examine the effect of the audio-visual multimedia intervention on pupils' academic performance in Arabic vocabulary. The results (Table 1) indicate a mean difference of -1.34 between pre- and post-test scores, suggesting a substantial improvement in post-test performance. The t-value of -6.664 with 24 degrees of freedom was statistically significant ($p < .001$). The 95% confidence interval for the mean difference ranged from -1.755 to -0.925, confirming the consistency of the improvement. Additionally, Cohen's $d = 1.34$, representing a large effect size, further substantiates the intervention's substantial impact on vocabulary acquisition. Normality was verified using the Shapiro-Wilk test ($p = 0.124$), confirming the appropriateness of parametric testing.

Table 2. Distribution of Pre- and Post-Test Scores

Score Range	Pre-Test (n, %)	Post-Test (n, %)
27 - 37	0 (0%)	25 (100%)
17 - 26	1 (4%)	0 (0%)
7 - 16	22(88%)	0 (0%)
1 – 6	2(8%)	0 (0%)
Total	**25 (100%)**	**25**(100%)

The comparative analysis reveals a substantial shift in pupils' performance after the multimedia intervention. Initially, as shown in Table 2, the majority of pupils (88%) scored in the low range (7–16), while a small proportion (8%) scored very low (1–6), and only one pupil (4%) reached the moderate range (17–26). No pupil achieved the highest score range (27–37) in the pre-test. Following the intervention, all pupils (100%) achieved scores in the highest range (27–37), with none remaining in the lower or moderate ranges. This significant improvement highlights the effectiveness of the audio-visual multimedia approach in enhancing academic performance, particularly in Arabic vocabulary acquisition. The results underscore the potential of interactive, multimedia-based instruction to elevate overall classroom achievement, demonstrating that the intervention benefits all pupils, not just select individuals.

Pupil Acceptance of Multimedia Intervention:-

Table 3. Pupils' Acceptance Scores by Gender

Gender	N	Mean	SD	df	t	p
Male	9	3.65	0.439	23	-1.310	0.203
Female	16	3.89	0.450			

The analysis of pupils' acceptance of the audio-visual multimedia approach, as mentioned in Table 3, indicates positive reception across both genders. Female pupils reported slightly higher acceptance ($M = 3.89$, $SD = 0.450$) compared to male pupils ($M = 3.65$, $SD = 0.439$). However, the independent-samples t-test revealed no statistically significant difference between male and female pupils ($t = -1.310$, $df = 23$, $p = 0.203 > 0.05$), suggesting that gender does not influence pupils' acceptance of the multimedia-based learning approach. These findings demonstrate that the intervention was well-received and engaging for all pupils, regardless of gender. The multimedia content, which incorporates visual, auditory, and interactive elements, aligns with diverse learning styles and supports inclusive learning. This highlights the potential of audio-visual multimedia as an effective instructional strategy in primary Arabic language education.

Table 4. Post-Test Academic Achievement Scores by Gender

Gender	N	Mean	SD	df	t	p
Male	9	3.85	0.453	23	-0.067	0.947
Female	16	3.86	0.448			

The comparison of post-test academic achievement scores, as stated in Table 4, between male and female pupils shows negligible differences. Male pupils scored a mean of 3.85 ($SD = 0.453$), while female pupils scored a mean of 3.86 ($SD = 0.448$). The independent-samples t-test confirmed that the difference is not statistically significant ($t = -0.067$, $df = 23$, $p = 0.947$), indicating that gender did not influence academic outcomes following the multimedia intervention. These results suggest that the audio-visual multimedia approach was equally practical for both male and female pupils. The intervention's inclusive design, which integrates visual, auditory, and interactive components, supports diverse learning preferences and promotes equitable learning opportunities. Consequently, the findings reinforce the potential of multimedia-based instruction to enhance Arabic vocabulary acquisition across all pupils, regardless of gender.

Discussion of Findings:-

The findings indicate that the audio-visual multimedia intervention significantly enhanced pupils' acquisition of Arabic vocabulary. The shift of all pupils to the highest achievement category underscores the intervention's effectiveness. This result aligns with prior studies showing that multimedia-based instruction, including animated videos and audio support, can accelerate vocabulary learning and improve comprehension (Rahimi et al., 2021;

Hanifah &Makruf, 2023; Safitri &Amar, 2023).From a theoretical perspective, the results support Mayer's Cognitive Theory of Multimedia Learning, which emphasizes dual-channel (visual and auditory) information processing, limited capacity, and active learning. The simultaneous engagement of multiple sensory modalities promotes deeper cognitive processing, sustained attention, and better long-term retention.Practically, the study provides evidence for educators and curriculum developers to adopt multimedia tools as an effective and engaging strategy in Arabic language instruction. Teachers are encouraged to integrate visual and auditory elements into lesson planning, while schools should invest in technological infrastructure to support multimedia-based learning. The intervention demonstrates that such approaches are inclusive, cater to diverse learning styles, and foster motivation, engagement, and meaningful learning experiences for all pupils.

Conclusion:-

In summary, the study rejects H_{01} and H_{02}, confirming that audio-visual multimedia significantly improves both academic achievement and pupil acceptance in Arabic vocabulary learning. $H_{03}$is accepted, indicating no gender differences in the intervention's effectiveness. The findings validate the application of multimedia technology in primary language education, reinforcing Mayer's Cognitive Theory of Multimedia Learning. These results also highlight practical implications for pedagogy and curriculum design, supporting inclusive, interactive, and technology-enhanced teaching approaches aligned with 21st-century learning goals. Nevertheless, the study's limitations, including a small sample size, a localized setting, and a short-term evaluation, suggest the need for further research with larger, more diverse samples and longitudinal designs to strengthen the evidence and inform national language education policies.

Acknowledgement:-

This study was financed by Geran Galakan Penyelidik Muda: GGPM-2025-022, UKM; Dana Pecutan Penerbitan and Dana Insentif Penerbitan from Faculty of Islamic Studies, Universiti Kebangsaan Malaysia.

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